MS APEAL BRIEF
PATENT
9031-1017

IN THE U.S. PATENT AND TRADEMARK OFFICE BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

In re application of	Appeal No.
Warren SMOOK et al.	Conf. 1343
Application No. 10/563,461	Group 3655
Filed January 5, 2006	Examiner Tisha D Lewis

GEAR TRANSMISSION UNIT WITH PLANET CARRIER

REPLY BRIEF

MAY IT PLEASE YOUR HONORS:

This is a reply to the Examiner's Answer of March 18, 2011.

STATUS OF THE CLAIMS

Claims 1-13, 15 and 16 are pending in this application from whose final rejection this appeal is taken. Claim 14 has been canceled.

GROUNDS OF REJECTION

A first ground of rejection on appeal is whether claims 1-12, 15 and 16 were properly rejected under 35 U.S.C. § 103(a) as being unpatentable over WO 02/079644 (WO '644) in view of WO 0157398 (WO '398).

A second ground of rejection on appeal is whether claims 1-13, 15 and 16 were properly rejected under 35 U.S.C.

§ 103(a) as being unpatentable over WO 02/14690 (WO '690) in view of WO '398.

A third ground of rejection on appeal is whether claims 1-13, 15 and 16 were properly rejected under 35 U.S.C. § 103(a) as being unpatentable over WO 03/014566 (WO '566) in view of WO '398.

A fourth ground of rejection on appeal is whether claim 13 was properly rejected under 35 U.S.C. § 103(a) as being unpatentable over WO '644 in view of WO '398, and further in view of WO '690 and WO '566.

ARGUMENT

The Examiner's Answer fails to apply a correct level of skill to one of ordinary skill in the art.

In conducting the analysis of the present application in view of the prior art, the Examiner's Answer continues to apply a level of ordinary skill in the art that does not maintain the necessary objectivity.

As stated in the MPEP 2141.03(III), "The importance of resolving the level of ordinary skill in the art lies in the necessity of maintaining objectivity in the obviousness inquiry." *Ryko Mfg. Co. v. Nu-Star, Inc.*, 950 F.2d 714, 718, 21 USPQ2d 1053, 1057 (Fed. Cir. 1991). "The examiner must ascertain what would have been obvious to one of ordinary skill in the art at the time the invention was made, and not to the inventor, a

judge, a layman, those skilled in remote arts, or to geniuses in the art at hand." *Environmental Designs, Ltd. v. Union Oil Co.*, 713 F.2d 693, 218 USPQ 865 (Fed. Cir. 1983), *cert. denied*, 464 U.S. 1043 (1984)(emphasis added). In this case, this issue is particularly important because the person of ordinary skill in the art would not have come to the present invention by combining the teachings of the prior art.

Like the rejections maintained in the previous Office Actions, the Examiner's Answer reasons as if one of ordinary skill would not understand the functioning and engineering principle behind a planetary gear transmission with a bogie plate. The Examiner maintains that all of the features of claim 1 are present in each of the three primary references WO '644, WO '690 and WO '566 except for the "bearings being taper roller bearings." The Examiner relies on WO '398 for teaching taper roller bearings on which the planet gears are mounted and concludes that it would have been obvious to replace the bearings of the primary reference into taper roller bearings.

When reasoning in such a manner, the Examiner's Answer is actually providing to one of ordinary skill in the art a very low level of skill. The Answer implicitly assumes that the person of ordinary skill in the art would not understand the difference between a planet carrier of the cage type as in WO '398 and a planet carrier with a bogie plate as in the primary references WO '644, WO '690 and WO '566. This

position is not in line with the principles set forth in the MPEP 2141.03(I) that the "hypothetical 'person having ordinary skill in the art' to which the claimed subject matter pertains would, of necessity have the capability of understanding the scientific and engineering principles applicable to the pertinent art." *Ex parte Hiyamizu*, 10 USPQ2d 1393, 1394 (Bd. Pat. App. & Inter. 1988).

When applying such a low level of skill, the Examiner also assumes that one of ordinary skill does not read or apply what is actually disclosed in the cited prior art references. The Answer fails to consider another principle established in the MPEP 2141.02(VI), "A prior art reference must be considered in its entirety, i.e., as a whole, including portions that would lead away from the claimed invention." *W.L. Gore & Associates, Inc. v. Garlock, Inc.*, 721 F.2d 1540, 220 USPQ 303 (Fed. Cir. 1983), *cert. denied*, 469 U.S. 851 (1984).

So, for example, WO '644 teaches that the configuration with bogie plate is an elastic, resilient design, wherein it is explicitly recommended to use spherical roller bearings because these bearings are able to compensate for misalignments of the planet shafts due to the load on the bogie plate, thus avoiding overstressing the planetary gears. In contrast to the position taken in the Examiner's Answer, the advantages of taper roller bearings in a cage type planet carrier described in WO '398 (see, page 4) are not

advantageous when the same taper roller bearings are used in a planetary gear transmission with a bogie plate.

Furthermore, if a low level of skill is given to "one of ordinary skill," then such a person would not even consider the teachings of the primary references when designing the present invention. A configuration with a bogie plate is much more complicated than a configuration with a cage type planet carrier. One having the low level of skill applied in the Examiner's Answer would not have understood the advantages of such a bogie plate configuration according to the primary references and would have used the simpler configuration proposed in WO '398 alone.

The Office must apply a higher level of skill to the person of ordinary skill and acknowledge that one would understand the engineering principles behind the proposed configurations. In that case, one of ordinary skill would understand that the configuration with bogie plate needs some elasticity or resilience and that it is therefore not obvious to use taper roller bearings in such a configuration.

One of ordinary skill in the art would not replace spherical roller bearings of the primary reference with taper roller bearings of WO '398.

In the Response to Argument section beginning at page 10, the Examiner's Answer rejects Applicants' position that the advantages mentioned in WO '398 are not advantages in a configuration with bogie plate. The Answer states: "The WO '398 art advantages are provided based on how the taper bearings support the planet gears and not based on the type of planet carrier being used."

First, this statement does not provide an answer to Applicants' position that in WO '398, the advantages are in regard to a configuration having cylindrical roller bearings. If one uses spherical roller bearings having inclined rollers, the prior art fails to teach any reason to use taper roller bearings. At page 4, WO '398 states: "the contact pressure of the individual roller contacts is better distributed than in prior art constructions because of the inclined direction of loading ..." This statement fails to teach or suggest that the replacement of spherical roller bearings having inclined rollers with taper roller bearings, which also have inclined rollers, results in a better load distribution.

Second, WO '398 fails to teach or suggest any advantages of using spherical roller bearings compared to tapered roller bearings and fails to teach or suggest which type of these bearings is better suited to use in the configuration of the primary references. Indeed, page 4 of WO '398 refers to Figure

2a and Figure 3 from which it is clear that tapered roller bearings are compared with cylindrical roller bearings.

The Examiner's Answer appears to hold the position that all types of bearings are interchangeable, because they all serve to support certain elements in a rotatable manner. This position neglects that bearing manufacturers perform a great deal of research in order to develop all types of bearings adapted for specific uses. Thus, one of ordinary skill would not merely replace one type of bearing known from one application by another type of bearing known from another application.

Furthermore, while the advantages defined in WO '398 do not explicitly mention the type of planet carrier used, WO '398 implicitly teaches that certain characteristics of the cage type planet carrier are present. WO '398 also makes reference to Figures 2a and 3 in which a cage type planet carrier is represented.

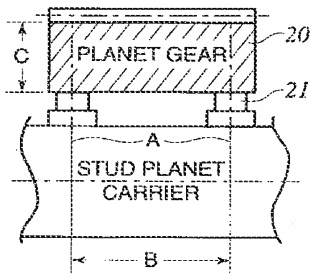

FIG. 2a

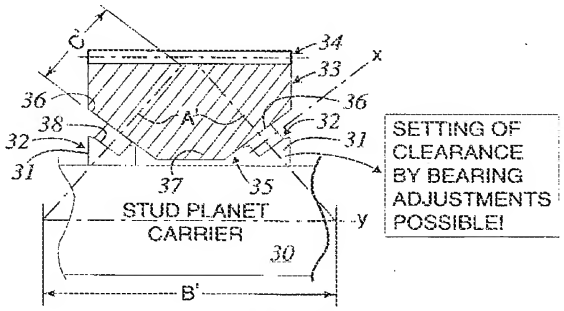

FIG. 3

For instance, at page 4, WO '398 states "increased working distance (B and B' in Figs 2a and 3) because of the

inclined working lines A' in O-arrangement of the two tapered bearings results in better stability, for instance versus moments created by the presence of axial forces inherent in the use of helical gears". The advantage of "better stability" under moment load only exists in a cage type planet carrier and not in a configuration with a bogie plate.

Indeed, in a cage type planet carrier, the planet shafts are supported at both extremities in the planet carrier. The increased working distance directs the force load coming from the gears more toward the support on the planet carrier, so that the moment load (the force multiplied by the distance from the support) on these supports is minimized. In contrast, in a planetary gear transmission with bogie plate, the planet shafts are unsupported at one extremity, so that by increasing the working distance of a load force coming from the gears and acting in the direction of the unsupported side on the planet shaft, as proposed in WO '398, the moment load on the supported extremity of the planet shaft is actually increased, resulting in less stability.

This demonstrates that the advantages stated in WO '398 are in relation to a configuration with a cage type planet carrier and cylindrical bearings, and therefore, the teachings of WO '398 are not applicable to the configurations

described in the primary references of WO '644, WO '690 and WO '566.

At pages 12-14, the Examiner's Answer further goes on to cite case law in order to develop a position that "The advantages given in the WO '398 art (paragraph 23 to 29) for using taper roller bearings for supporting planet gears in a windmill gearbox suggest that appellant's improvement as recited in claim 1 would yield no more than a predictable result which is already known in the field via the WO '398 art." (see, page 14, lines 9-12). On the contrary, if there is anything predictable based on the teachings of the cited references, it is the following:

1. that in a configuration with a bogie plate, when rigid planet bearings are used "... a considerable risk applies of the rotor breaking down in case the forces on the planetary holder are instantaneously very heavy ..." (see, WO '644, page 1, Background);

2. that in a configuration with a bogie plate, spherical roller bearings are proposed so that "the rollers 25' in the bearings of the planetary wheels can move slightly on the spherical tracks 25" as the bogie shaft 29 is slightly turned ..." (see, WO '644, page 6, last paragraph); and

3. that with a taper roller bearing, "setting of minimal clearance or even preload, together with increased stiffness leads to a high level of precision in positioning

of the output shaft both under no load and under load conditions ...” (see, WO ‘398, page 4, last paragraph).

When one of ordinary skill in the art analyzes the teachings of the prior art, one is clearly instructed not to use tapered roller bearings in a configuration with a bogie plate, because such rigid tapered roller bearings are more likely to cause a break down of the wind turbine rotor. Based on the teachings of the prior art, one of ordinary skill would have expected that the application of tapered roller bearings in a configuration of the primary references would not be workable.

The Examiner’s Answer further contends that “The appellant argues that one of skill in the art would not use the taper roller bearings of the WO ‘398 art in the WO ‘644 art due to the rigid design and the advantages of the taper bearing not being applicable for the WO ‘644 art.” (See, Answer, page 14, lines 16-18). The Answer continues, “These arguments seem to be arguments against appellant’s own invention because if taper roller bearings as used in the WO ‘398 art would not work with the WO ‘644 art (which uses the exact same transmission structure as appellant’s, bogie plate included) then the same would be true for appellant’s claimed transmission structure.” (See, page 14, lines 18-22).

The Examiner’s Answer appears to have inadvertently misinterpreted and reworded Applicants’ arguments. Applicants

have never taken the position that a configuration with a bogie plate with taper roller bearings for supporting the planet wheels is unworkable. The point is that the advantages disclosed in WO '398 regarding the use of tapered roller bearings compared to the use of cylindrical bearings for supporting the planet gears in a cage type planet carrier are not advantages when these taper roller bearings are used in a configuration according to WO '644. As explained above, one of ordinary skill in the art would recognize that these "advantages" turn into "disadvantages" in the WO '644 type configuration. It is well established, and as stated in the MPEP 2144.01, "[I]n considering the disclosure of a reference, it is proper to take into account not only specific teachings of the reference but also the inferences which one skilled in the art would reasonable be expected to draw therefrom." *In re Preda*, 401 F.2d 825, 826, 159 USPQ 342, 344 (CCPA 1968).

Thus, the reasoning set forth in the Examiner's Answer does not conform to the principles established in KSR: "rejections on obviousness cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness." (*KSR International Co. v. Teleflex Inc.*, 550 U.S. ___, 82 USPQ2d 1385 at 1396 (2007), quoting *In re Kahn*, 441 F.3d 977, 988, 78 USPQ2d 1329, 1336 (Fed. Cir. 2006)).

CONCLUSION

The foregoing discussion underscores the impropriety of the rejections on appeal and supports the showing made in Appellant's main brief that those rejections should be reversed. Accordingly, Applicants respectfully request such action.

Respectfully submitted,

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